

## NOTES AND EXTRACTS.

## FIFTIETH ANNIVERSARY OF THE METEOROLOGICAL SOCIETY OF FRANCE.

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On Tuesday, June 2, 1903, the Meteorological Society of France celebrated privately the fiftieth anniversary of its foundation. At the monthly meeting which took place on that day, at 5:30 p. m., M. Violle, the president, made the following address, reviewing the origin of the society, the principal events of its existence, the tasks it has accomplished, and those which now present themselves to its activity:

The history of the society has been recently brought to your attention by my illustrious colleague, M. Georges Lemoine. I can add nothing to his masterly essay, but wish simply to render homage to the founders of the Meteorological Society of France, and, in order to make this worthy of them, I will quote the words of our regretted colleague, Renou, telling how, in the spring of 1852, wishing to publish a series of meteorological observations, carefully collected by him in Versailles, he learned that for several years past a meteorological annual had been published in that city.

Three men, without private fortune, but devoted to science, according to Renou, courageously undertook, at their own risk, this publication in the year 1848, with the generous co-operation of the publishers, Gaume Frères. These three men were Hoeghens, Martins, and Bérigny. I was not acquainted with them. I hastened to Versailles. They told me that, notwithstanding all their devotion, they could not continue so onerous a publication. I expressed to them the regret that such a decision caused me, but at the same time indulged the hope that the necessary funds might be procured by founding a meteorological society, and I proposed to present them to Charles Sainte-Claire Deville, after having previously conferred with him. This I did. Charles Sainte-Claire Deville received the proposition warmly and promised to take an active interest in it. He called to his aid Bravais and d'Abbadie, and on August 17, 1852, a successful appeal was made to the scientific world.

One hundred and forty-four persons responded to the invitation of the founders. Among these were Babinet, Becquerel, Elie de Beaumont, Belgrand, Brongniard, Chatin, Daubrée, Dumas, Geoffrey Saint Hilaire, Milne Edwards, Pouillet, Ritter, and, soon afterwards, Le Verrier, to cite only the most illustrious.

The first meeting, where the constitution of the society was adopted, took place December 14, 1852. Bravais was president and Charles Sainte-Claire Deville secretary. After three other preparatory meetings, on February 15, 1853, the society inaugurated its scientific sessions, which, as the proceedings show, were already of great interest.

The history of the society is contained in its annual volumes, the fiftieth of which has just been published. There all the acts of its civil existence may be followed, from its birth up to the time of its declaration of public utility (May 26, 1869), and thence to the time of its golden jubilee, which we celebrate to-day. As to its scientific life, this is attested by the numerous and learned memoirs with which M. Georges Lemoine recently entertained you, as well as by the series of observations collected with unceasing care at nearly every point in France.

The series of observations previous to the year 1878 must be sought in our annual volumes, since it was in that year, thanks in great part to the efforts of the Meteorological Society and of its zealous president, Herve Mangon, that the Central Meteorological Bureau of France was established. One of its duties is to centralize and publish these observations, and the scrupulous exactness with which this laborious

task is to-day accomplished gives a special interest to the long series of observations at Versailles, which are of such great utility as a control for the values obtained in Paris. Again, it is in our annual volumes that the first series of the precise observations made at Parc Saint Maur since 1872 are to be found. Being desirous of collecting all the data—those given by ordinary instruments as well as those furnished by the phenomena of vegetation—the society published, in addition, each year from 1868 until the establishment of the Central Bureau, a volume of meteorological items (*nouvelles*), which contains valuable information for the history of the time.

But perhaps the most important service that our society has rendered to science is its unceasing effort to obtain accurate observations. The utility of pursuing, beyond certain limits, data of temperature and barometric pressure may be disputed; but the person who makes the observations is certainly bound to give to them all possible accuracy. From the publication of the first annual volume, the attention of the observers has been earnestly directed to this point; and during fifty years Renou has made active warfare against bad observations. To him are due the first meteorological instructions which were published at the expense of the Meteorological Society in 1855, and which still remain a standard even after the remarkable instructions marked out by M. Angot.

The society will continue to maintain among its members a bond of esteem and sympathy; it will publish their works with gratitude and faithfully record their observations. Devoted equally to works requiring many years and to new ideas it will faithfully prosecute the fundamental observations which seem to be as necessary to meteorology as to astronomy and will courageously follow such paths of activity as offer themselves.

There are certain questions which are of special interest:

(1) The decrease of temperature with altitude in our atmosphere, only vaguely appreciated up to this time, but which now seems clear to us in its essential features, up to heights of ten or fifteen kilometers, thanks to the valuable researches of our colleague, M. Teisserenc de Bort. The results already obtained are a sure guarantee of progress in the future.

(2) The general circulation of the atmosphere as to which a real inspiration had enlightened us as far as the information collected at the surface of our globe allowed, is now placed clearly before our eyes by the methodical observations of the clouds and the direct determination of the upper currents.

(3) Is it necessary that I should tell you of the rôle played in these studies by mountain observatories, balloons, and kites? The advantages that meteorology will derive from the exploration of the upper atmosphere are fully as great as those offered to geology by delving into the deep mines. However important the mountain observatories may be it is certain that the influence of the surface of the earth modifies the atmospheric phenomena to a certain extent. Neither the wind, the temperature, nor the electric condition appear as they would at the same elevation above a vast plain. Both the balloon and the kite avoid this objection almost entirely and enable us to make actual soundings in the free atmosphere at much greater heights than can be attained by even the most elevated observatories. The repetition of the soundings at the same place and their agreement at different points, furnish a control which formerly seemed reserved to stationary observatories established in order to secure direct observations at a permanent location.

The success of these explorations of the atmosphere inspires the desire to ascend higher and higher. So many are the problems that are luring us up.

(4) We know to-day beyond all manner of doubt that there

are certain light gases which, although nearly absent from the surface of the ground, prevail in the upper strata. What is the composition of the air at different elevations?

(5) We know that an intense ionization is produced by the solar rays and is extinguished in the upper atmospheric strata. What are the consequences of this phenomenon? Is the key to the storms to be found in it?

(6) At the same time the solar radiation appears to us as manifestly the direct cause of all the phenomena. Its study imposes itself upon us as the surest means of determining the true nature of our sun. Is it a variable star? Is it continually decreasing? These questions are of the first importance for the very existence of our planet.

From a nearer point of view, is it not evident that if we knew certainly the laws of this complex radiation, and the manner in which it acts upon our atmosphere, we could deduce from this the weather conditions at a certain fixed time? And this assuredly is the real problem of meteorology.<sup>1</sup>

There is plenty of work for everyone, my dear colleagues. Each of us should do his best on the problems which interest him most and should make every effort to maintain for the Meteorological Society of France the high reputation which it has acquired during the first fifty years of its existence.

#### METEOROLOGY AT WILLIAMS COLLEGE, MASSACHUSETTS.

Mr. Willis I. Milham, Director of the Field Memorial Observatory, Williams College, Williamstown, Mass., states that observations have been taken at that place since 1816. The records for the first twenty-two years and the last twenty years are in good condition, but those for the other years are either missing or very imperfect. Systematic instruction in meteorology is also given in the college. Last year lectures on this subject were given for three weeks in connection with the course on descriptive astronomy. This year there will be a half-year course, three times a week, on meteorology and eight or ten men will elect this course, which it is hoped will become a permanent feature.

#### IS THERE A SEVEN-YEAR CYCLE IN RAINFALL IN ILLINOIS?

In the Tenth Report of the State Entomologist of the State of Illinois, or the Fifth Annual Report of Dr. Cyrus Thomas, dated December 30, 1880, and printed in the Transactions of the Department of Agriculture of the State of Illinois for the year 1880, Dr. Thomas has an extensive article (pp. 47-59), on the relation of meteorological conditions to insect development. By combining the records from stations in Illinois and neighboring portions of Iowa and Missouri, beginning with the record at Athens in 1840 and including Augusta, Chicago, Dubuque, St. Louis, and other stations not mentioned, but rejecting Cairo and the early records at Sandwich, Dr. Thomas compiled a table and diagrams giving the monthly and annual total rainfall and average temperature, both of which showed systematic cycles of seven years each.

<sup>1</sup> If the complex radiation from the sun has any variations in its complexity or its intensity, these will probably exert corresponding influences on the earth's atmosphere and the weather experienced at any station. Now we observe that our weather is extremely variable, from hour to hour and day to day, without any accompanying appreciable variation in the solar radiation. It is, therefore, evident that our weather conditions at any moment are subject to a large range of variability due to changes in our own atmospheric conditions occurring under the influence of a constant solar radiation. We have not yet been able to explain the character and extent of these variations, but there is every evidence that they are the mechanical and physical phenomena proper to the earth's atmosphere itself. We are not yet in a position that warrants us to believe that if we knew the variations in the solar radiation we could deduce or predict weather conditions any better than when the radiation is uniform and constant.—C. A.

We do not know the method adopted in compiling these tables of averages. The published Table, 3, Average Monthly Rainfall of Illinois for 1854-1877, would be very valuable for climatological study if we could feel sure that each figure represents the average for the whole State, computed by a uniform method throughout the table. But from the fact that Dr. Thomas mentions that for the year 1872 he had only the record for one doubtful station, we infer that all of his averages are formed by combining whatever stations were available without taking account of certain principles recognized by modern climatology. As these principles are liable to be neglected by other students, we recapitulate them as follows:

1.—When several stations have records for different groups of years and are to be combined together into one general average of many years, we must eliminate the differences between the records, depending on the differences in the exposure of the gages and in the kinds of gages, as also those depending upon the distances of the stations from each other and also those depending on the monthly and annual irregularities in rainfall.

2.—The effects of exposure and location at the same locality can ordinarily be best determined by comparing records taken at the same time at the two stations or gages.

3.—If several stations are combined in order to form a mean for any one month or year, then those same stations must appear in every other monthly or annual mean that is to be compared with the former, in order to eliminate chronological variations. In order to secure monthly or annual means for this latter purpose, when no observed record is at hand, one must interpolate geographically between neighboring stations. In this way every monthly mean becomes comparable with the others because it depends upon the same stations. Thus, also, the general averages for different parts of a State will depend upon the same fundamental period of years.

4.—In general, it is most convenient to reduce each observed monthly and annual value to ratios or statements of percentages, adopting the average annual rainfall as the divisor.

It is only when we have many stations thus corrected for chronological and geographic irregularities that we are properly prepared to begin the search for cycles or other systematic changes. The values for successive years, as published in Dr. Thomas's table, are not sufficiently homogeneous to allow of basing on them any study into secular periodicity of precipitation.

#### WEATHER BUREAU MEN AS INSTRUCTORS.

Mr. C. F. von Herrmann, Section Director, Raleigh, N. C., has been detailed by order of the Chief of Bureau to respond to the request for instruction in meteorology at the Agricultural and Mechanical College at West Raleigh. According to the preliminary schedule forwarded by Mr. von Herrmann, the senior class will receive a full course of instruction, using Waldo's Elementary Meteorology as the basis. The recitations will occupy one hour each week during the college term of thirty-six weeks. An additional course of lectures will also be delivered covering the following topics:

1. The atmosphere: Composition, density, arrangement, physical properties, etc.
2. The temperature of the atmosphere.
3. The temperature of the atmosphere with reference to the climates of the earth.
4. The pressure of the air.
5. The moisture of the air, its condensation into frost, dew, fog, clouds, etc.
6. Precipitation.
7. Winds and the general circulation.